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calculated point of origin 17 for the projectiles/impact objects 19. Such capability may be facilitated by operably coupling the user interface 50 into a position identifier system, such as a global positioning system (GPS), global command and control system (GCCS) 72, inertial navigation system, etc.

The active light sources 445a may change color, light intensity, and/or flash to assist the operator in identifying proper orientation of the turret 427. For example, the light sources 445a may change from red, to yellow, to green as the turret 427 is rotated into proper positioning with axis 21 of impact origin 17. Alternatively, the light sources 445a may change light intensity as the turret 427 is rotated into alignment with axis 21, or may flash at different rates as the turret 427 is rotated into alignment with axis 21.

The system 12 may also activate the light sources 445a based upon the relative elevation of the weapon 437 in order to ensure that the light sources 445a are oriented on the source of the projectiles/impact objects. Thus, when the weapon 437 is pivoted about axis, the active light sources 445a also move to maintain the relative bearing to the calculated point of origin 17 for the projectiles/impact objects 19 (FIG. 2).

In one illustrative embodiment, different vertically spaced bands of light sources 445a may be illuminated to indicate desired weapon elevation along axis 21. Alternatively, the color of the light sources may change based upon desired weapon elevation. The intensity or flashing rates of the light sources 445a may also change as the weapon 437 is pivoted into alignment with origination axis 21. In a similar manner, different circumferentially or horizontally spaced columns of light sources 445a may be illuminated to indicate desired traverse or horizontal position of weapon about vertical axis 431.

User inputs, such as right and left control grips 447a and 447b may be manipulated by the hands of an operator to move the weapon 437. The control grips 447a and 447b may each include input buttons to control traverse and elevation of the weapon 437 by controlling actuators 444a and 444b, as further detailed herein. Control grips 447a and 447b may also include conventional triggers to permit the operator 434 to fire the weapon 437. In certain illustrative embodiments, the control grips 447a and 447b may provide a tactile damage event warning which is sent to the operator 436. Such tactile event warning may provide an indication of a damage event alone or together with an orientation of the damage event on the vehicle 425. For example, the control grips 447a and 447b may vibrate or shake to alert the operator 436 of a damage event. Subsequent vibrating or shaking of the right control grip 447a will provide an indication to the operator 436 to move the weapon 437 to the right, while subsequent vibration or shaking of the left control grip 447b will provide an indication to the operator 436 to move the weapon 437 to the left.

A dashboard 449 may be supported by the weapon mount 440 and is positioned in front of the seat 438 for supporting the control grips 447a and 447b. The dashboard 449 is operably coupled to the turret 427 and is configured to rotate therewith. A heads-up display 451 may extend above the dashboard 449 and includes a transparent panel 452 having a surface upon which information is projected for view by the operator 434.

With reference to FIGS. 31 and 32, different images 459, 461, 463, 465, 467 may be projected on the display 451. For example, images 459 and 463 may indicate to the operator 434 to change the elevation of the weapon 437 based upon the detected impact for alignment with origination axis 21.

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More particularly, images 459a and 463a indicate that the weapon 437 should be raised, while images 459b and 463b indicate that the weapon should be lowered. Similarly, images 461 and 465 may indicate to the operator 434 to traverse (move the rotational position of) the weapon 437 based upon the detected impact for alignment with origination axis 21. More particularly, images 461a and 465a indicate that the weapon should be rotated to the right, while arrows 461b and 465b indicate that the weapon should be rotated to the left. Information, such as video and/or text instructions may be projected within display window 467.

In certain illustrative embodiments, display 453 is operably coupled to the human machine interface (HMI) 269, while display 455 is operably coupled to the global command and control system (GCCS) 72. Displays 453 and 455 may provide graphical information and/or receive input from the operator.

A further illustrative embodiment is shown in FIGS. 33-35B as including turret 427 with the seat 438 removed for clarity. Circumferentially spaced right and left indicator uprights or columns 471a and 471b, respectively, are supported on opposite sides of turret opening 472 receiving weapon 437. Each indicator upright 471a and 471b includes a plurality of display devices arranged in a plurality of laterally spaced columns. More particularly, each upright 471a and 471b illustratively includes a plurality the vertically spaced light sources 473. The light sources 473 may comprise light emitting diodes (LEDs), illustratively multi-color LEDs.

Activation of the light sources 473 is based upon input from the system 12 on the determined origin of the ballistic impact. More particularly, the system 12 activates the light sources (identified by reference numbers 473a) based upon the relative position of the weapon 437 in order to ensure that the light sources 473a are oriented on the source of the projectiles/impact objects. Thus, when the elevation of the weapon 437 changes, the active light sources 473a also move to maintain the relative bearing to the calculated point of origin 17 for the projectiles/impact objects 19 (FIG. 2).

Rotational orientation of the turret 427 may be indicated by changing intensity, color, or flash patterns of light sources 473a. For example, green may indicate the proper direction in which to turn, while red means no adjustment is required. Alternatively, light intensity or flashing patterns of light sources 473a may indicate the proper direction in which to turn. Alternatively, additional displays may be used in combination with light sources 473 on uprights 471 to facilitate proper orientation of turret 427.

User inputs, such as control grips 447 may be manipulated by the hands of an operator to rotate turret 427, and thus the weapon 437. Control grips 447 may also include conventional triggers to permit the operator to fire the weapon 437.

FIG. 34A shows a situation when the origin 17 of impact object is determined to be above the target alignment of the weapon 437. As such, the light sources 473a on an upper end of the indicator uprights 471 are activated. As the weapon 437 is raised, the active light sources 473a lower toward the middle of the uprights 471. At the proper target elevation (i.e., when the weapon 437 is aligned with origination axis 21), the light sources may change intensity, color, or flash to provide a clear indication to the operator that the proper target has been acquired.

FIG. 34B shows a situation when the origin 17 of impact object is determined to be below the target alignment of the weapon 437. As such, the light sources 473a on a lower end of the indicator uprights 471 are activated. As the weapon 437 is lowered, the active light sources 473a raise toward the